

**Claim 63. (Cancelled)**

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**REMARKS**

Claims 1-4, 8-18, 38-40, 48 and 54-63 are pending.

Claims 1, 10, 38, 48, 54 and 55 are amended.

Claims 11, 57, 58 and 60-63 are cancelled.

No new matter is added.

Applicants respectfully request reconsideration and withdrawal of all rejections, in view of the amendments and remarks herein.

**Claim Rejection - Double Patenting**

Claims 1-4, 8-18, 38-40, 48, 54-55, 57-58 and 60-63 are rejected on the grounds of non-statutory obviousness-type double patenting as being unpatentable over claims 1-11 of U.S. Patent No. 6,786,948 (the '948 Patent).

The U.S. Patent and Trademark Office ("PTO") appears to argue that the pending claims are not patentably distinct from claims 1-11 of the '948 Patent, because the claimed invention is either anticipated by, or would have been obvious over, the claims.

Applicants respectfully disagree. Applicants point out that the analysis employed in an obviousness-type double patenting determination parallels the guidelines for an obviousness (35 U.S.C. § 103) rejection. *See* MPEP § 804.

It is therefore pointed out that all claims of the '948 Patent require that the "concentration of calcium in said soil is from about 0.128 mM to about 5 mM" (and said

pH is maintained below about 7.0). In contrast, the claimed invention is concerned with an elevated pH but does not require a particular concentration of calcium in soil. That is, unlike the '948 Patent, the claimed invention does not require any adjustment in soil calcium concentration for hyperaccumulation. Indeed, because all claims of the '948 Patent require that the "concentration of calcium in said soil is from about 0.128 mM to about 5 mM", it is submitted that no claim of the '948 Patent teaches or suggests metal hyperaccumulation via a soil pH of 5.6 to 7.0 (without any requirement for soil calcium concentration), as in the claimed invention.

In fact, claims 1, 10, 38, 54 and 55 are amended as indicated above to replace the phrase "comprising" with the phrase "consisting essentially of", thereby clarifying only that in contrast to the '948 Patent, the claimed invention does not require that the "concentration of calcium in said soil is from about 0.128 mM to about 5 mM". Such amendment is clearly supported by Table 1 which shows the hyperaccumulation of metal (e.g., nickel) without the necessity of any adjustment in soil calcium concentration. Those of ordinary skill in the art will recognize that since all claims of the '948 Patent require a particular concentration of calcium in soil, no claim of the '948 Patent teaches or suggest the claimed invention, which concerns hyperaccumulation via a soil pH of 5.6 to 7.0 (without such a soil calcium concentration). See MPEP § 804.

Accordingly, it is respectfully submitted that no claim of the '948 Patent teaches or suggests the claimed invention, and therefore, the claimed invention must be considered patentably distinct from all claims of the '948 Patent.

Applicants respectfully request withdrawal of the rejection.

**Claim Rejection – 35 U.S.C. 112, second paragraph**

Claims 48, 57, 60-61 and 63 are rejected under 35 U.S.C. § 112, first paragraph, as lacking enablement.

Applicants respectfully disagree.

Nevertheless, Applicants have amended claim 48 and cancelled claims 57, 60-61 and 63, as indicated above, but only to advance prosecution.

With respect to the cancelled claims, Applicants urge that the rejection is moot.

With respect to claim 48, it is pointed out that the claim has been amended to recite that “the at least one metal is nickel, wherein said plant further accumulates at least one other metal selected from the group consisting of cobalt, palladium, rhodium, ruthenium, platinum, iridium, osmium, rhenium and mixtures thereof.” Support for this amendment can be found in the specification at page 10, lines 20-23, wherein it is explained that certain plants hyperaccumulate nickel, wherein “[t]hese plants also naturally accumulate cobalt and may accumulate metals such as Zn, Mn and Cd, and metals from the platinum and palladium families including Pd, Rh, Ru, Pt, Ir, Os and Re.” Further support for this amendment is found in Table 1 of the specification, wherein it is shown that elevated pH levels as claimed result in the hyperaccumulation of nickel as well as the accumulation of additional metals such as cobalt. Therefore, in that one of ordinary skill in the art viewing the pending application would understand that the plants and pH levels as claimed provide for the hyperaccumulation of nickel as well as the accumulation of other metals, Applicants urge that claim 48 is fully enabled.

Applicants respectfully request withdrawal of the rejection.

**Claim Rejection – 35 U.S.C. 102(b)**

Claims 38-40 are rejected under 35 U.S.C. § 102(b) as being anticipated by Homer et al. (Plant and soil, 138:195-205 (1991)).

The PTO appears to argue that Homer et al. teaches that the concentration of nickel in the above-ground plant tissue exceeds the concentration of metal in the soil by a factor of at least 2, for example by comparing nickel content in soil (100 ug/g) versus *Alyssum* leaves (more than 1,000 ug/g).

Applicants respectfully disagree. It is pointed out that independent claim 38 is amended as indicated above to clarify that the claimed invention is concerned with hyperaccumulation with an elevated soil pH, in particular “cultivating at least one hyperaccumulator plant in metal-containing soil, whereby the pH of the soil is maintained between 5.6 and 7.0”.

In contrast, Homer et al. is directed to reducing soil pH for metal accumulation. For example, Homer et al. points out that “[t]he pH of the rooting medium was in the range of 4.4-5.3 . . . .” *Homer et al.*, page 203, second column. Homer et al. further points out that “[i]t has been reported (Alkway, 1990) that at low pH, Ni and Co become more available to the plant, resulting in increased metal uptake.” *Id.* Thus, Homer et al. not only fails to teach or suggest hyperaccumulation with a soil pH between 5.6 and 7.0 as claimed, but Homer et al. teaches away from such an elevated pH.

Applicants therefore respectfully request withdrawal of the rejection.

Claims 38-40 are also rejected under 35 U.S.C. § 102(b) as being anticipated by Brooks et al. (Vegetation, 45:183-188 (1981)).

Applicants respectfully disagree. As noted above, independent claim 38 is concerned with hyperaccumulation with an elevated soil pH, in particular "cultivating at least one hyperaccumulator plant in metal-containing soil, whereby the pH of the soil is maintained between 5.6 and 7.0".

In contrast, Brooks et al. does not specifically address the influence of pH on metal accumulation. Brooks et al. certainly does not teach an elevated soil pH for nickel accumulation. In contrast, Brooks et al. speculates that elevated pH levels may reduce metal accumulation, stating that "[a]t lower nickel levels, there was inhibition of uptake . . . probably due to either competition from calcium or to a raising of the pH of the substrate." *Brooks et al.*, page 187, second column (*emphasis added*). Thus, Brooks et al. not only fails to teach or suggest hyperaccumulation with a soil pH between 5.6 and 7.0 as claimed, but Brooks et al. teaches away from such an elevated pH.

Applicants therefore respectfully request withdrawal of the rejection.

Claim 62 is rejected under 35 U.S.C. § 102(b) as being anticipated by Homer et al. (Plant and soil, 138:195-205 (1991)).

Applicants respectfully disagree.

Nevertheless, Applicants have cancelled claim 62, as indicated above, but only to advance prosecution. In view of such claim cancellation, Applicants urge that the rejection is moot.

Applicants therefore respectfully request withdrawal of the rejection.

Claim 58 is rejected under 35 U.S.C. 102(b) as anticipated by Baker et al. (New Phytol. (1994), 127, 61-68)<sup>1</sup> in light of Baker and Brooks (Biorecovery, 1:81-126 (1989)).

Applicants respectfully disagree.

Nevertheless, Applicants have cancelled claim 58, as indicated above, but only to advance prosecution. In view of such claim cancellation, Applicants urge that the rejection is moot.

Applicants therefore respectfully request withdrawal of all rejections.

In view of the above, Applicants respectfully submit that this application is in condition for allowance and request favorable action thereon.

Applicants submit that this paper is timely filed, and therefore, no further fees are due. However, in the event that the fees submitted prove to be insufficient in connection with the filing of this paper, please charge our Deposit Account Number 50-0578 and please credit any excess fees to such Deposit Account.

Respectfully submitted,  
KRAMER & AMADO, P.C.



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<sup>1</sup> Although pages 6-7 of the Office Action cite Brooks et al. (Vegetation, 45:183-188 (1981)) as the primary reference for this rejection, the Examiner generously confirmed by telephone that this cite is an error. The intended primary reference is Baker et al. (New Phytol. (1994), 127, 61-68).